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out magnifying power on clear dark nights in April last. It is less than half a degree east of X^1 *Orionis.*

Mar. 31. Scarcely as bright as X^2 of 6th magnitude, but brighter than the white star one third of a degree west of X^1.
April 5, 7, 11, 12. Ditto.
20. Equal to above-mentioned white star. Moonlight.
28. Less than white star.
May 1. Ditto. It has a hazy appearance different from the clear glow at maximum.
5. It is dimmer than the white star, but brighter than the nearest star of 8th magnitude towards the northwest.

A low altitude, sunlight, and cloudy nights hindered further observations until the beginning of October, when it was found to be of 10th magnitude.

Several observations were obtained of the recently found variable *W Lyræ* of irregular period. A maximum was predicted for October 13th, but cloudiness and moonlight prevented satisfactory comparisons, with the exception of the following:—

October 3. The variable is of 11th magnitude.
8. Ditto.
10. Equal to adjacent star of 10th magnitude.
11. It seems slightly decreased.
22. It is fully of 10th magnitude.

SAN FRANCISCO, October 23, 1899.

PLANETARY PHENOMENA FOR JANUARY AND FEBRUARY, 1900.

BY MALCOLM MCNEILL.

JANUARY.

The Earth is in perihelion on January 1st, 11 P. M., P. S. T.

Mercury is a morning star throughout the month, having passed greatest west elongation on December 25th. On January 1st it rises rather more than an hour and a half before sunrise, and the interval is more than an hour until nearly the middle of the month; so that it is in fair position for observation. On January 7th it passes close to *Saturn*, not quite 1° to the south.

Venus is an evening star, slowly increasing its apparent distance from the Sun. On January 1st it sets about two hours after sunset, and this interval increases by nearly three quarters of an hour during the month, mainly owing to the rapid northerly motion in Declination of the planet. It moves among the stars from the constellation *Capricornus* nearly through *Aquarius*, 27° eastward and 13° northward.

Mars is too near the Sun to be seen throughout the month, and is in conjunction with it on January 15th, changing from an evening to a morning star. It will not be at all conspicuous until nearly the close of the year, as it approaches its opposition in the spring of 1901.

Jupiter rises about three hours before sunrise on January 1st, and four and a half hours before on January 31st. It is in the constellation *Scorpio*, and moves about 6° eastward during the month. On the morning of January 4th it makes a very close approach to the third-magnitude star *β Scorpii*, the planet passing about 13′ south of the star. The time of nearest approach is about sunrise on the Pacific Coast.

Saturn passed conjunction with the Sun on December 17th, and by the beginning of the month is just beginning to be visible as a morning star. By the end of the month it rises two and one half hours before sunrise. It is in the western part of the constellation *Sagittarius*, and moves about 4° eastward during the month. On the morning of January 28th the Moon passes just to the north of the planet, and there will be an occultation for the region south and east of the United States.

Uranus rises from two to four hours before sunrise. It is about 20° west of *Saturn* in the constellation *Scorpio*, and moves slowly eastward.

Neptune is moving slowly westward near the border line of the constellations *Taurus* and *Gemini*.

FEBRUARY.

Mercury is a morning star at the beginning of the month, too near the Sun to be seen. It passes superior conjunction on February 9th, becoming an evening star, and moves away from the Sun, being well out toward east elongation by the close of the month; and setting nearly an hour and a half after sunset. It can probably be seen on a clear evening during the last week of the month.

Venus is an evening star, still slowly increasing its distance from the Sun; and on account of its relatively greater northward motion in Declination increasing its interval of visibility after sunset in still greater measure, until it is more than three hours at the close of the month. On the afternoon of February 1st it is 0° 13′ south of the fourth-magnitude φ *Aquarii*, and it moves rapidly eastward 30° and northward 14° from *Aquarius* through *Pisces*.

Mars is a morning star, but remains quite close to the Sun, its eastward motion among the stars being only a very little less than that of the Sun.

Jupiter rises about an hour and a half earlier than during January, and by the end of the month it comes up at a little after 1 A. M. It is in quadrature with the Sun on February 28th. It is in the constellation *Scorpio*, and moves about 3° eastward among the stars.

Saturn is also a morning star, rising two hours later than *Jupiter*, and moves eastward among the stars at about the same rate, 3° during the month. The Moon approaches the planet again very closely on the afternoon of February 24th, but the phenomenon occurs during daylight in the United States.

Uranus is in the neighborhood of *Jupiter*, 5° east and 1° 30′ south, in the constellation *Scorpio*. It moves about 1° eastward during the month, and at the end is only about 3° east of *Jupiter*.

Neptune remains in about the same position on the border of the constellations *Taurus* and *Gemini*.

JANUARY-FEBRUARY, 1900.

PHASES OF THE MOON, P. S. T.

			H.	M.	
New Moon,	January	1,	5	52	A.M.
First Quarter,	January	7,	9	40	P.M.
Full Moon,	January	15,	11	8	A.M.
Last Quarter,	January	23,	3	53	P.M.
New Moon,	January	30,	5	23	P.M.
First Quarter,	February	6,	8	23	A.M.
Full Moon,	February	14,	5	50	A.M.
Last Quarter,	February	22,	8	44	A.M.
New Moon.	February	29,	3	25	A.M.

THE SUN.

1900		R. A. H. M.	Declination. ° ′	Rises. H. M.	Transits. H. M.	Sets. H. M.
Jan.	1,	18 46	— 23 1	7 27 A.M.	12 4 P.M.	4 41 P.M.
	11,	19 30	— 21 50	7 26	12 8	4 50
	21,	20 13	— 19 56	7 22	12 11	5 0
Feb.	1,	20 59	— 17 8	7 13	12 14	5 15
	11,	21 39	— 14 4	7 2	12 14	5 26
	21,	22 18	— 10 37	6 50	12 14	5 38
Mar.	1,	22 48	— 7 38	6 38	12 13 P.M.	5 48

MERCURY.

Jan.	1,	17 15	— 22 0	5 52 A.M.	10 33 A.M.	3 14 P.M.
	11,	18 15	— 23 41	6 13	10 53	3 33
	21,	19 21	— 23 30	6 44	11 19	3 54
Feb.	1,	20 37	— 20 40	7 6	11 52	4 38
	11,	21 46	— 15 31	7 16	12 22 P.M.	5 28
	21,	22 56	— 8 3	7 19	12 52	6 25
Mar.	1,	23 46	— 1 9	7 15	1 11	7 7

VENUS.

Jan.	1,	20 39	— 20 10	9 9 A.M.	1 57 P.M.	6 45 P.M.
	11,	21 30	— 16 37	9 1	2 7	7 13
	21,	22 17	— 12 19	8 58	2 16	7 34
Feb.	1,	23 8	— 6 58	8 47	2 23	7 59
	11,	23 52	— 1 48	8 34	2 28	8 22
	21,	0 38	+ 3 26	8 21	2 32	8 43
Mar.	1,	1 10	+ 7 34	8 9	2 35	9 1

MARS.

Jan.	1,	19 2	— 23 37	7 46 A.M.	12 20 P.M.	4 54 P.M.
	11,	19 36	— 22 37	7 35	12 14	4 53
	21,	20 9	— 21 12	7 23	12 7	4 51
Feb.	1,	20 44	— 19 12	7 8	noon	4 52
	11,	21 16	— 17 0	6 51	11 52 A.M.	4 53
	21,	21 47	— 14 30	6 33	11 43	4 53
Mar.	1,	22 12	— 12 20	6 18	11 36	4 54

JUPITER.

Jan.	1,	15 57	— 19 37	4 24 A.M.	9 15 A.M.	2 6 P.M.
Feb.	1,	16 20	— 20 36	2 48	7 35	12 22
Mar.	1,	16 33	— 21 5	1 14	5 59	10 44 A.M.

SATURN.

Jan.	1,	17 50	— 22 26	6 29 A.M.	11 8 A.M.	3 47 P.M.
Feb.	1,	18 5	— 22 27	4 41	9 20	1 59
Mar.	1,	18 15	— 22 24	3 1	7 40	12 19

Uranus.

Jan. 1,	16 34	− 21 55	5 11 A.M.	9 52 A.M.	2 33 P.M.
Feb. 1,	16 40	− 22 8	3 16	7 56	12 36
Mar. 1,	16 44	− 22 14	1 29	6 9	10 49 A.M.

Neptune

Jan. 1,	5 39	+ 22 4	3 35 P.M.	10 54 P.M.	6 13 A.M.
Feb. 1,	5 36	+ 22 3	1 31	8 50	4 9
Mar. 1,	5 35	+ 22 4	11 40 A.M.	6 59	2 18

Eclipses of *Jupiter's* Satellites, P. S. T.

(Off left-hand limb as seen in an inverting telescope.)

		H. M.			H. M.
I, D,	Jan. 4,	3 24 A.M.	I, D,	Feb. 3,	5 37 A.M.
I, D,	11,	5 28	I, D,	5,	12 6
II, D,	12,	3 32	II, D,	6,	12 27
II, D,	19,	6 5	I, D,	12,	1 59
I, D,	20,	1 50	II, D,	13,	3 0
III, R,	23,	1 19	II, R,	13,	5 18
I, D,	27,	3 43	I, D,	19,	3 52
III, D,	30,	3 47	II, D,	20,	5 32
III, R,	30,	5 17	I, D,	26,	5 46
			I, D,	28,	12 14